

energy&fuels

MAY 2016

VOLUME 30 ISSUE 5

ENFUEM 30(5) 3559–4384 (2016)

ISSN 0887-0624

Registered in the U.S. Patent and Trademark Office

© 2016 by the American Chemical Society

SPECIAL SECTION: 16TH INTERNATIONAL CONFERENCE ON PETROLEUM PHASE BEHAVIOR AND FOULING**Editorial**

3559

DOI: 10.1021/acs.energyfuels.6b00629

16th International Conference on Petroleum Phase Behavior and Fouling
Carlos Lira-Galeana***Articles**

3560

DOI: 10.1021/acs.energyfuels.5b01874

Investigation of the Gas Injection Effect on Asphaltene Onset Precipitation Using the Cubic-Plus-Association Equation of State
Alay Arya, Nicolas von Solms, and Georgios M. Kontogeorgis*

3575

DOI: 10.1021/acs.energyfuels.5b01951

Predicting the Viscosity of Hydrocarbon Mixtures and Diluted Heavy Oils Using the Expanded Fluid Model
F. Ramos-Pallares, F. F. Schoeggl, S. D. Taylor, M. A. Satyro, and H. W. Yarranton*

3596

DOI: 10.1021/acs.energyfuels.5b02065

Study of the Adhesion Force of Asphaltene Aggregates to Metallic Surfaces of Fe and Al
A. Ortega-Rodriguez, S. A. Cruz, I. Garcia-Cruz, and C. Lira-Galeana*

3605

DOI: 10.1021/acs.energyfuels.5b02074

Molecular Dynamics Methodology for the Evaluation of the Chemical Alteration of Wettability with Organosilanes
Ivan Moncayo-Riascos,* Jennifer de León, and Bibian A. Hoyos

3615

DOI: 10.1021/acs.energyfuels.5b02086

Effects of Extraction pH on the Fourier Transform Ion Cyclotron Resonance Mass Spectrometry Profiles of Athabasca Oil Sands Process Water
Mark P. Barrow,* Kerry M. Peru, Dena W. McMartin, and John V. Headley

3622

Role of Electrical Submerged Pumps in Enabling Asphaltene-Stabilized Emulsions
Sebastiano Correra,* Massimo Iovane, and Stefano Pinelli

DOI: 10.1021/acs.energyfuels.5b02083

3630

Beyond the Average Molecule Description of Asphaltenes: Hyphenated Gel Permeation Chromatography and Spectroscopic Analyses
Lucia Bonoldi, Cristina Flego,* and Luigi Galasso

DOI: 10.1021/acs.energyfuels.5b02094

3637

Determination of Chlorine in Crude Oil by High-Resolution Continuum Source Graphite Furnace Molecular Absorption Spectrometry Using AlCl, InCl, and SrCl Molecules
Michele S. P. Enders, Alexandre O. Gomes, Raphael F. Oliveira, Regina C. L. Guimarães, Marcia F. Mesko, Erico M. M. Flores, and Edson I. Müller*

DOI: 10.1021/acs.energyfuels.5b02100

3644

Role of Asphaltenes and Additives on the Viscosity and Microscopic Structure of Heavy Crude Oils
Lilian Padula, Lia Beraldo da Silveira Balestrin, Nelson de Oliveira Rocha, Carlos Henrique Monteiro de Carvalho, Harry Westfahl Jr., Mateus Borba Cardoso, Edvaldo Sabadini, and Watson Loh*

DOI: 10.1021/acs.energyfuels.5b02103

3652

Laboratory Two-Dimensional Experimental Simulation of Catalytic *In Situ* Upgrading
Christian Nubar Hossepiān,* Lante Carbognani Ortega, and Pedro Pereira-Almao

DOI: 10.1021/acs.energyfuels.5b02117

3660

Kinetic Modeling of a Heat Generator for the Fluidization of Paraffin Deposits Using In-line Infrared Spectroscopy with the Development of a Graphical User Interface
Vinícius Kartnaller, Marcos V. Romualdo, Victor T. V. Lobo, and João Cajaiba*

DOI: 10.1021/acs.energyfuels.5b02101

3666

In Situ Observation of Fouling Behavior under Thermal Cracking Conditions: Hue, Saturation, and Intensity Image Analyses
Cédric Laborde-Boutet,* David Dinh, Fabian Bender, Miguel Medina, and William C. McCaffrey

DOI: 10.1021/acs.energyfuels.5b02135

3676

Effect of Emulsified Water on Asphaltene Instability in Crude Oils
Mohammad Tavakkoli, Andrew Chen, Chi-An Sung, Kelly M. Kidder, Je Jin Lee, Saeed M. Alhassan, and Francisco M. Vargas*

DOI: 10.1021/acs.energyfuels.5b02180

3687

Modified Asphaltene Capillary Deposition Unit: A Novel Approach to Inhibitor Screening
Saugata Gon* and David M. Fouchard

DOI: 10.1021/acs.energyfuels.5b02185

3693

Alkanes Induced Asphaltene Precipitation Studies at High Pressure and Temperature in the Presence of Argon
D. Hartmann, H. E. Lopes, C. L. S. Teixeira, M. C. K. de Oliveira, G. Gonzalez, E. F. Lucas, and L. S. Spinelli*

DOI: 10.1021/acs.energyfuels.5b02217

3707

Determination of Simulated Crude Oil Mixtures from the North Sea Using Atmospheric Pressure Photoionization Coupled to Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
Matthias Witt* and Wiebke Timm

DOI: 10.1021/acs.energyfuels.5b02353

Reviews

3714

Review of Particle Physics and Chemistry in Fluidized Beds for Development of Comprehensive Ash Agglomeration Prediction Models
Aditi B. Khadilkar, Peter L. Rozelle, and Sarma V. Pisupati*

DOI: 10.1021/acs.energyfuels.6b00079

Articles

Fossil Fuels

3735

Nucleation of Methane Hydrate in Water-in-Oil Emulsions: Role of the Phase Boundary
Andrey S. Stoporev, Andrey Yu. Manakov,* Viktor I. Kosyakov, Vladimir A. Shestakov, Lubov' K. Altunina, and Larisa A. Strelets

DOI: 10.1021/acs.energyfuels.5b02279

3742

Nanoaggregation of Polyaromatic Compounds Probed by Electrospray Ionization Mass Spectrometry
Lan Liu, Johan Sjöblom, and Zhenghe Xu*

DOI: 10.1021/acs.energyfuels.5b02390

3752

Electron Microscopy Characterization of Crystalline Nanostructures Present in Asphaltene
J. Arenas-Alatorre,* P. S. Schabes-Retchkiman,* and V. Rodriguez-Lugo

DOI: 10.1021/acs.energyfuels.5b02407

3758

Quantitative Molecular Characterization of Petroleum Asphaltenes Derived Ruthenium Ion Catalyzed Oxidation Product by ESI FT-ICR MS
Xibin Zhou, Suoqi Zhao, and Quan Shi*

DOI: 10.1021/acs.energyfuels.5b02533

3768

Low Salinity Effect at Pore Scale: Probing Wettability Changes in Middle East Limestone
N. R. Pedersen,* T. Hassenkam, M. Ceccato, K. N. Dalby, K. Mogensen, and S. L. S. Stipp

DOI: 10.1021/acs.energyfuels.5b02562

3776

Hydrocarbon Fluid Inclusions, API Gravity of Oil, Signature Fluorescence Emissions and Emission Ratios: An Example from Mumbai Offshore, India
V. Nandakumar* and J. L. Jayanthi

DOI: 10.1021/acs.energyfuels.5b02952

3783

Application of ICP-MS and ICP-OES on the Determination of Nickel, Vanadium, Iron, and Calcium in Petroleum Crude Oils via Direct Dilution
Laura Poirier, Jenny Nelson, David Leong, Lidia Berhane, Paul Hajdu, and Francisco Lopez-Linares*

DOI: 10.1021/acs.energyfuels.5b02997

3791

Newly Prepared Nano Gamma Alumina and Its Application in Enhanced Oil Recovery: An Approach to Low-Salinity Waterflooding
Sajad Kiani, Mostafa Mansouri Zadeh, Saeed Khodabakhshi, Alimorad Rashidi,* and Jamshid Moghadasi

DOI: 10.1021/acs.energyfuels.5b03008

3798

Reactions and Transformations of Mineral and Nonmineral Inorganic Species during the Entrained Flow Pyrolysis and CO₂ Gasification of Low Rank Coals
Joanne Tanner, Marc Bläsing, Michael Müller, and Sankar Bhattacharya*

DOI: 10.1021/acs.energyfuels.5b03012

3809

Structure Characterization and Model Construction of Indonesian Brown Coal
Hua-lin Lin,* Ke-jian Li, Xuwen Zhang, and Hongxue Wang

DOI: 10.1021/acs.energyfuels.5b02696

3815

Liquid Crystal Observations in Emulsion Fractions from Brazilian Crude Oils by Polarized Light Microscopy
Angela C. P. Duncke, Thiago O. Marinho, Carla N. Barbato, Gizele B. Freitas, Márcia C. K. de Oliveira, and Márcio Nele*

DOI: 10.1021/acs.energyfuels.5b02943

3821

Influence of Water Vapor on Surface Morphology and Pore Structure during Limestone Calcination in a Laboratory-Scale Fluidized Bed
Hui Wang,* Shuai Guo, Danyu Liu, Li Yang, Xing Wei, and Shaohua Wu

DOI: 10.1021/acs.energyfuels.6b00067

3831

Effects of Iron Ores on the Pyrolysis Characteristics of a Low-Rank Bituminous Coal
Hongyu Zhao, Yuhuan Li, Qiang Song, Junxin Lv, Yuanfeng Shu, Xinxing Liang, and Xinqian Shu*

DOI: 10.1021/acs.energyfuels.6b00061

3840

Methane Adsorption Characteristics and Adsorbed Gas Content of Low-Rank Coal in China
Xin Li, Xuehai Fu,* Aihua Liu, Hui An, Geoff Wang, Xuesong Yang, Lijun Wang, and Hongdong Wang

DOI: 10.1021/acs.energyfuels.6b00071

3849

Bitumen Recovery from Carbonates by a Modified SOS-FR (Steam-Over-Solvent Injection in Fractured Reservoir) Method Using Wettability Alteration Chemicals
Mohammedalmojtaba Mohammed and Tayfun Babadagli*

DOI: 10.1021/acs.energyfuels.6b00176

3860

Evaluation of Different Factors on Enhanced Oil Recovery of Heavy Oil Using Different Alkali Solutions
Haiyan Zhang,* Guangying Chen, Mingzhe Dong, Suoqi Zhao, and Zhiwu Liang*

DOI: 10.1021/acs.energyfuels.6b00196

3870

Adsorption of Sulfur Compounds from Diesel with Ion-Impregnated Activated Carbons
Teng-Chien Chen, Michelle L. Agripa, Ming-Chun Lu,* and Maria Lourdes P. Dalida

DOI: 10.1021/acs.energyfuels.6b00230

3879

Kinetic Promotion and Inhibition of Methane Hydrate Formation by Morpholinium Ionic Liquids with Chloride and Tetrafluoroborate Anions
Wonhee Lee, Ju-Young Shin, Ki-Sub Kim,* and Seong-Pil Kang*

DOI: 10.1021/acs.energyfuels.6b00271

3886

Evidence of Aromaticity-Specific Maltene NMR Relaxation Enhancement Promoted by Semi-immobilized Radicals
Amin Ordikhani-Seyedlar, Oliver Neudert, Siegfried Staaf,* Carlos Mattea, Ravinath Kausik, Denise E. Freed, Yi-Qiao Song, and Martin D. Härtlmann

DOI: 10.1021/acs.energyfuels.6b00273

3894

Calculation of Average Molecular Parameters, Functional Groups, and a Surrogate Molecule for Heavy Fuel Oils Using ¹H and ¹³C Nuclear Magnetic Resonance Spectroscopy
Abdul Gani Abdul Jameel, Ayman M. Elbaz, Abdul-Hamid Emwas, William L. Roberts, and S. Mani Sarathy*

DOI: 10.1021/acs.energyfuels.6b00303

3906

Linking Thermoplastic Development and Swelling with Molecular Weight Changes of a Coking Coal and Its Pyrolysis Products
Quang Anh Tran,* Rohan Stanger, Wei Xie, Nathan Smith, John Lucas, and Terry Wall

DOI: 10.1021/acs.energyfuels.6b00324

3917

High-Efficiency Extraction and Modification on the Coal Liquefaction Residue Using Supercritical Fluid with Different Types of Solvents
Xiongchao Lin,* Shouyi Li, Fenghua Guo, Guangce Jiang, Xujun Chen, and Yonggang Wang

DOI: 10.1021/acs.energyfuels.6b00326

3929

Simultaneous Characterization of Water Content and Distribution in High-Water-Cut Crude Oil
Yan Song, Hong L. Zhan,* Kun Zhao,* Xin Y. Miao, Zhi Q. Lu, Ri M. Bao, Jing Zhu, and Li Z. Xiao

DOI: 10.1021/acs.energyfuels.6b00340

3934

DOI: 10.1021/acs.energyfuels.6b00386
Acylamide and Amine Oxide Derivatives of Linear and Hyperbranched Polyethylenimines. Part 1: Comparison of Tetrahydrofuran Hydrate Crystal Growth Inhibition Performance
 Malcolm A. Kelland* and Mohamed F. Mady

3941

DOI: 10.1021/acs.energyfuels.6b00444
Asphaltene Aggregation: Influence of Composition of Copolymers Based on Styrene-Stearyl Methacrylate and Styrene-Stearyl Cinnamate Containing Sulfate Groups
 Luis C. M. Palermo and Elizabeth F. Lucas*

3947

DOI: 10.1021/acs.energyfuels.6b00477
Potential Application of Silica Nanoparticles for Wettability Alteration of Oil–Wet Calcite: A Mechanistic Study
 Abolfazl Dehghan Monfared, Mohammad Hossein Ghazanfari,* Mohammad Jamialahmadi, and Abbas Helalizadeh

3962

DOI: 10.1021/acs.energyfuels.6b00497
Calculation of the Total Sulfur Content in Crude Oils by Positive-Ion Atmospheric Pressure Photolionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
 Yuri E. Corilo,* Steven M. Rowland, and Ryan P. Rodgers*

3967

DOI: 10.1021/acs.energyfuels.6b00503
Slagging Characteristics of Zhundong Coal during Circulating Fluidized Bed Gasification
 Guoliang Song,* Xiaobin Qi, Weijian Song, and Qinggang Lu

3975

DOI: 10.1021/acs.energyfuels.6b00514
Sintering Characteristic in Catalytic Gasification of China Inner Mongolia Bituminous Coal Ash
 Yandong Mao,* Yadan Jin, Kezhong Li, Jicheng Bi, Jinlai Li, and Feng Xin

3986

DOI: 10.1021/acs.energyfuels.6b00569
Release of Crude Oil from Silica and Calcium Carbonate Surfaces: On the Alteration of Surface and Molecular Forces by High- and Low-Salinity Aqueous Salt Solutions
 Xiaoyan Liu, Wei Yan, Erling H. Stenby, and Esben Thormann*

Biofuels and Biomass

3994

DOI: 10.1021/acs.energyfuels.6b00042
Effect of Operating Parameters and Moisture Content on Municipal Solid Waste Pyrolysis and Gasification
 Jun Dong, Yong Chi,* Yuanjun Tang, Mingjiang Ni, Ange Nzhou, Elsa Weiss-Hortala, and Qunxing Huang

4002

DOI: 10.1021/acs.energyfuels.6b00077
Enhancing Food Waste Hydrolysis and the Production Rate of Volatile Fatty Acids by Prefermentation and Hydrothermal Pretreatments
 Xiaoqin Yu, Jun Yin,* Kun Wang, Dongsheng Shen, Yuyang Long, and Ting Chen

4009

DOI: 10.1021/acs.energyfuels.6b00096
Studies of Distribution Characteristics of Inorganic Elements during the Liquefaction Process of Cornstalk
 Tianhua Yang, Weidan Wang, Xingping Kai, Bingshuo Li, Yang Sun, and Rundong Li*

4017

DOI: 10.1021/acs.energyfuels.6b00122
Process Simulation of Dual Fluidized Bed Gasifiers Using Experimental Data
 Alberto Alamia,* Henrik Thunman, and Martin Seemann

4034

DOI: 10.1021/acs.energyfuels.6b00126
Gasification of Wood and Torrefied Wood with Air, Oxygen, and Steam in a Fixed-Bed Pilot Plant
 N. Cerone, F. Zimbardi,* A. Villone, N. Striugas, and E. G. Kiyikci

4044

DOI: 10.1021/acs.energyfuels.6b00157
Impact of Biomass Ash–Bauxite Bed Interactions on an Indirect Biomass Gasifier
 Jelena Marinkovic,* Martin Seemann, Georg L. Schwebel, and Henrik Thunman

4053

DOI: 10.1021/acs.energyfuels.6b00163
Influence of Torrefaction on Biomass Gasification Performance in a High-Temperature Entrained-Flow Reactor
 Xiaoke Ku,* Jianzhong Lin,* and Fangyang Yuan

4065

DOI: 10.1021/acs.energyfuels.6b00169
Transient Catalytic Activity of Calcined Dolomitic Limestone in a Fluidized Bed during Gasification of Woody Biomass
 M. Pohořely, M. Jeremić,* S. Skoblia, Z. Beňo, M. Šyc, and K. Svoboda

4072

DOI: 10.1021/acs.energyfuels.6b00174
Online Size and Element Analysis of Aerosol Particles Released from Thermal Treatment of Wood Samples Impregnated with Different Salts
 Adrian Hess,* Mohamed Tarik, Debora Foppiano, Philip Edinger, and Christian Ludwig*

4085

DOI: 10.1021/acs.energyfuels.6b00226
Investigation of the Performance and Solvent-Resistant Properties of NH₂-Modified MWCNTs/PES-Based Mixed Matrix Membranes for Biodiesel Separation
 Elsie Bet-Moushoul, Yaghoub Mansourpanah,* Khalil Farhad, and Ali Mohammad Nikbakht

4096

DOI: 10.1021/acs.energyfuels.6b00262
Optimization of Hydrogen Production by Response Surface Methodology Using γ -Irradiated Sludge as Inoculum
 Yanan Yin and Jianlong Wang*

4104

Alkylation of Fatty Acids in Supercritical Alcohols
Ram C. Narayan and Giridhar Madras*

DOI: 10.1021/acs.energyfuels.6b00266

4112

Development of an Online Raman Analysis Technique for Monitoring the Production of Biofuels
Keyvan Mollaian, Suying Wei, Mohammad R. Islam, Bleinie Dickerson, William E. Holmes, and Tracy J. Benson*

DOI: 10.1021/acs.energyfuels.6b00313

4118

Mannosylerthritol Lipid-A as a Pour Point Depressant for Enhancing the Low-Temperature Fluidity of Biodiesel and Hydrocarbon Fuels
Chandraprasad Madihalli, Harshal Sudhakar, and Mukesh Doble*

DOI: 10.1021/acs.energyfuels.6b00315

4126

Pyrolysis Oil Combustion In a Horizontal Box Furnace with an Externally Mixed Nozzle
Frank C. Lujaji, Akwasi A. Boateng,* Mark A. Schaffer, Charles A. Mullen, Iddi S. N. Mkilaha, and Peter L. Mtui

DOI: 10.1021/acs.energyfuels.6b00318

4137

Use of Near-Infrared Spectroscopy, Partial Least-Squares, and Ordered Predictors Selection To Predict Four Quality Parameters of Sweet Sorghum Juice Used To Produce Bioethanol
Cristiane C. Guimarães, Camila Assis, Maria Lúcia F. Simeone, and Marcelo M. Sena*

DOI: 10.1021/acs.energyfuels.6b00408

4145

Characterization of Pyrolytic Sugars in Bio-Oil Produced from Biomass Fast Pyrolysis
Yun Yu,* Yee Wen Chua, and Hongwei Wu*

DOI: 10.1021/acs.energyfuels.6b00464

Environmental and Carbon Dioxide Issues

4150

Removal of Fine Particulate Matter by Spraying Attapulgite Suspending Liquid
Huichao Chen,* Wei Wu, Cai Liang, and Xin Wu

DOI: 10.1021/acs.energyfuels.5b02491

4159

Impacts of Mineral Reaction Kinetics and Regional Groundwater Flow on Long-Term CO₂ Fate at Sleipner
Guanru Zhang, Peng Lu, Xiaomei Wei,* and Chen Zhu*

DOI: 10.1021/acs.energyfuels.5b02556

4181

Enhancement of CO₂ Capture on Biomass-Based Carbon from Black Locust by KOH Activation and Ammonia Modification
Changming Zhang,* Wen Song, Qingliang Ma, Lijing Xie, Xiaochao Zhang,* and Hua Guo

DOI: 10.1021/acs.energyfuels.5b02764

4191

Preparation of Fly-Ash-Modified Bamboo-Shell Carbon Black and Its Mercury Removal Performance in Simulated Flue Gases
Rui Tang, Wei Yang, Hui Wang, Jie Zhou, Zhixiao Zhang, and Shengji Wu*

DOI: 10.1021/acs.energyfuels.5b02795

4197

Where Lower Calcite Abundance Creates More Alteration: Enhanced Rock Matrix Diffusivity Induced by Preferential Dissolution
Hang Wen, Li Li,* Dustin Crandall, and Alexandra Hakala

DOI: 10.1021/acs.energyfuels.5b02932

4209

Molecular Transformations of Arsenic Species in the Flue Gas of Typical Power Plants: A Density Functional Theory Study
Xuesen Du,* Jiyun Tang, Xiang Gao, Yanrong Chen, Jingyu Ran, and Li Zhang

DOI: 10.1021/acs.energyfuels.5b03029

4215

Mass-Transfer Characteristics of the CO₂ Absorption Process in a Rotating Packed Bed
Miaopeng Sheng, Baochang Sun,* Fuming Zhang, Guangwen Chu, Lili Zhang, Chengguang Liu, Jian-Feng Chen, and Haikui Zou*

DOI: 10.1021/acs.energyfuels.6b00074

4221

Inner Relationship between CO, NO, and Hg in a 6 kW_{th} Circulating Fluidized Bed Combustor under an O₂/CO₂ Atmosphere
Hui Wang, Yufeng Duan,* Ya-ning Li, Yuan Xue, and Meng Liu

DOI: 10.1021/acs.energyfuels.6b00119

4229

Influence of CO₂-Brine Co-injection on CO₂ Storage Capacity Enhancement in Deep Saline Aquifers: An Experimental Study on Hawkesbury Sandstone Formation
T. D. Rathnaweera, P. G. Ranjith,* M. S. A. Perera, and A. Haque

DOI: 10.1021/acs.energyfuels.6b00113

4244

Layered Double Hydroxides/Multiwalled Carbon Nanotubes-Based Composite for High-Temperature CO₂ Adsorption
Lakshminarayana Kudlalli Gopalakrishna Bhatta,* Seetharamu Subramanyam, Madhusoodana D. Chengala, Umananda Manjunatha Bhatta, Puspender Guha, Raghavendra Prasad Havenje Dinakar, and Krishna Venkatesh

DOI: 10.1021/acs.energyfuels.6b00141

4251

Screening of NiFe₂O₄ Nanoparticles as Oxygen Carrier in Chemical Looping Hydrogen Production
Shuai Liu, Fang He,* Zhen Huang, Anqing Zheng, Yipeng Feng, Yang Shen, Haibin Li, Hao Wu, and Peter Glarborg

DOI: 10.1021/acs.energyfuels.6b00284

4263

Influence of CO₂ Residual of Regenerated Amine on the Performance of Natural Gas Sweetening Processes Using Alkanolamine Solutions
Abolghasem Kazemi,* Ali Kazemi Joujili, Arjomand Mehrabani-Zeinabad, Zahra Hajian, and Reza Salehi

DOI: 10.1021/acs.energyfuels.6b00295

Efficiency and Sustainability

4274

Simultaneous Determination of Hydrocarbon, Nitrogen, Sulfur, and Their Boiling Range Distribution in Vacuum Gas Oil Using a High Temperature CNS-SimDis Analyzer
Ramachandra Chakravarthy, Anilkumar Savalia, Sudhir Kulkarni, Ganesh N. Naik, Unnikrishnan Sridharan, Chandra Saravanan, Asit Kumar Das, and Kalagouda B. Gudasi*

Catalysis and Kinetics

4283

Numerical Simulation of CO₂ Adsorption on K-Based Sorbent
Li Zhang, Yanlong Yin, Lei Li, Feng Wang, Quanbin Song, Ning Zhao,* Fukui Xiao, and Wei Wei*

4292

Kinetic Analyses of Gasification and Combustion Reactions of Carbonaceous Feedstocks for a Hybrid Solar/Autothermal Gasification Process To Continuously Produce Synthesis Gas
Alexander P. Muroyama and Peter G. Loutzenhiser*

Combustion

4300

Influence of Boiler Load on Generation Characteristics of PM_{2.5} Generated by a 660 MW Pulverized Coal Boiler
Qian Du,* Heming Dong, Lipeng Su, Zhifeng Zhao, Donghui Lv, and Min Wang

4307

Emission and Morphological Characteristics and Elemental Compositions of Fine Particulate Matter from an Industrial Pulverized Coal Boiler Equipped with a Fabric Filter in China
Guangbo Zhao, Zhifeng Zhao, Xin Guo, Qian Du,* Jianmin Gao, Heming Dong, Yang Cao, Qiang Han, and Lipeng Su

4318

Study of Oxidation and Combustion Characteristics of Iron Nanoparticles under Idealized and Engine-like Conditions
Charalampos Mandilas,* George Karagiannakis, Athanasios G. Konstandopoulos,* Carlo Beatrice, Maurizio Lazzaro, Gabriele Di Blasio, Santiago Molina, José V. Pastor, and Antonio Gil

4331

Impact of Fuel and Injection Timing on Partially Premixed Charge Compression Ignition Combustion
Chenxi Sun, Dongli Kang, Stanislav V. Bohac, and Andre L. Boehman*

4346

Effects of High Concentrations of CO₂ on the Lower Flammability Limits of Oxy-methane Mixtures
Xianzhong Hu, Qingbo Yu,* Nan Sun, and Junxiang Liu

4353

Formation of Reductive and Corrosive Gases during Air-Staged Combustion of Blends of Anthracite/Sub-bituminous Coals
Zhi Zhang, Zhenshan Li,* and Ningsheng Cai

Process Engineering

4363

Noninvasive Ultrasound Measurements of Temperature Distribution and Heat Fluxes in Solids
Yunlu Jia and Mikhail Sklar*

4372

Hydrogen Production from Ventilation Air Methane in a Dual-Loop Chemical Looping Process
Yongxing Zhang,* Elham Doroodchi, Behdad Moghtaderi, Xiaojuan Han, and Yushan Liu

Communications

4381

Significant Evolution of Hydrogen Fluoride from Coal Chars after Apparently Complete Release of Carbon Dioxide
Naoto Tsubouchi,* Yuuki Mochizuki, Naoyuki Iwabuchi, Yuuki Akama, and Yasuo Ohtsuka

Supporting Information available via online article